SBOX-2000

Fanless Box Computing

User's Manual

Version 1.1

SINTRONES It's different

SINTRONES® Technology Corp.

User Manual

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Disclaimer

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SINTRONES® Technology Corp. makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy;however, no guarantee is given as to the correctness of the contents. For continuing product improvement, SINTRONES® Technology Corp. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

This device complies to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a SINTRONES Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by SINTRONES® Technology Corp. Dispose used battery according to the manufacturer's instructions.

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1 Function Introduction

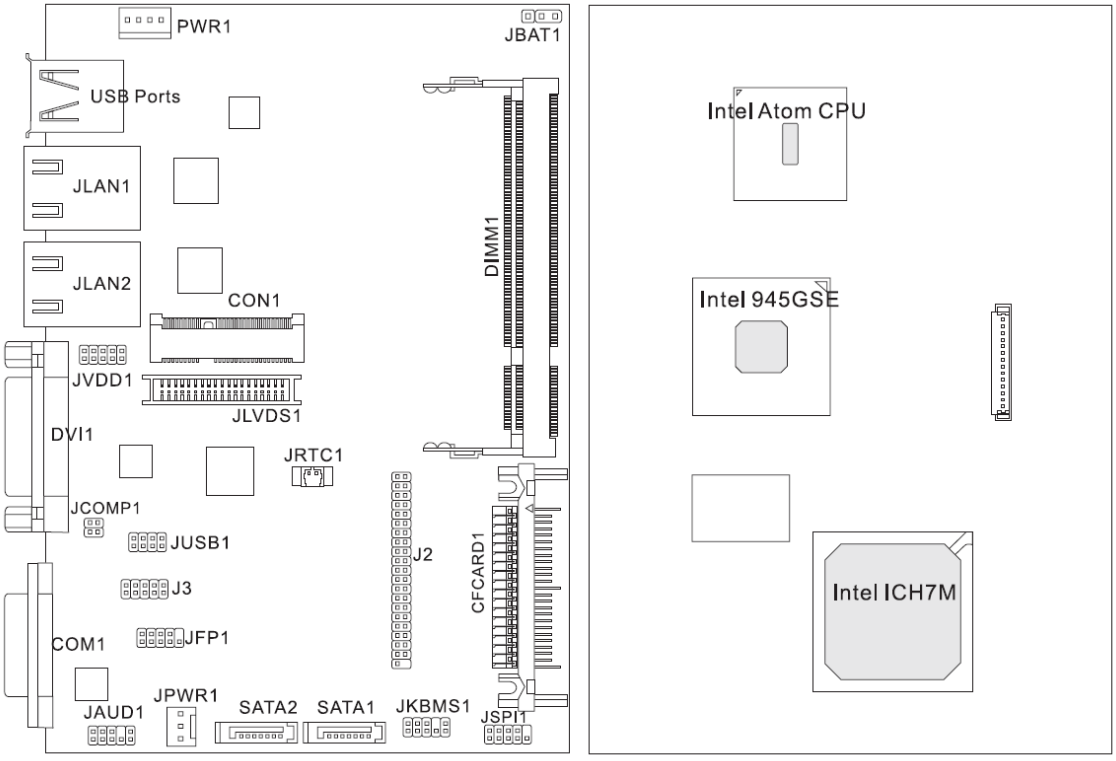
■ 1.1 Model Specifications

CPU	• Intel Atom N270 1.6GHz Processor with 533MHz FSB
Chipset	• Intel 945GSE + ICH7M
Memory	• 1 x DDRII-533 SO-DIMM Up to 2GB
Display	• Integrated Intel GMA-950 GFx Core in 945GSE MCH
ATA	• 1 x Serial ATA port with 150MB/s HDD transfer rate
LAN Chipset	• 2 x Intel 82574L Gigabit Ethernet
Watchdog	• 1 ~ 255 level reset
Serial Port	• Support 2 x RS-232 ports and 1 x RS232/422/485
USB Port	• 4 x USB 2.0 ports
LAN	• 2 x RJ45 ports for GbE
Video Port	• 1 x DVI-I female connector for DVI-D and VGA Output
GPIO Port	• Support 4 in and 4 out GPIO ports (share with 1 x RS232)
Audio	• Mic-in/Line-out
Expansion Bus	• 1 x Mini-card slot
Storage	• 1 x 2.5" drive bay for SATA Type Hard Disk Drive / SSD
Qualification	• CE, FCC

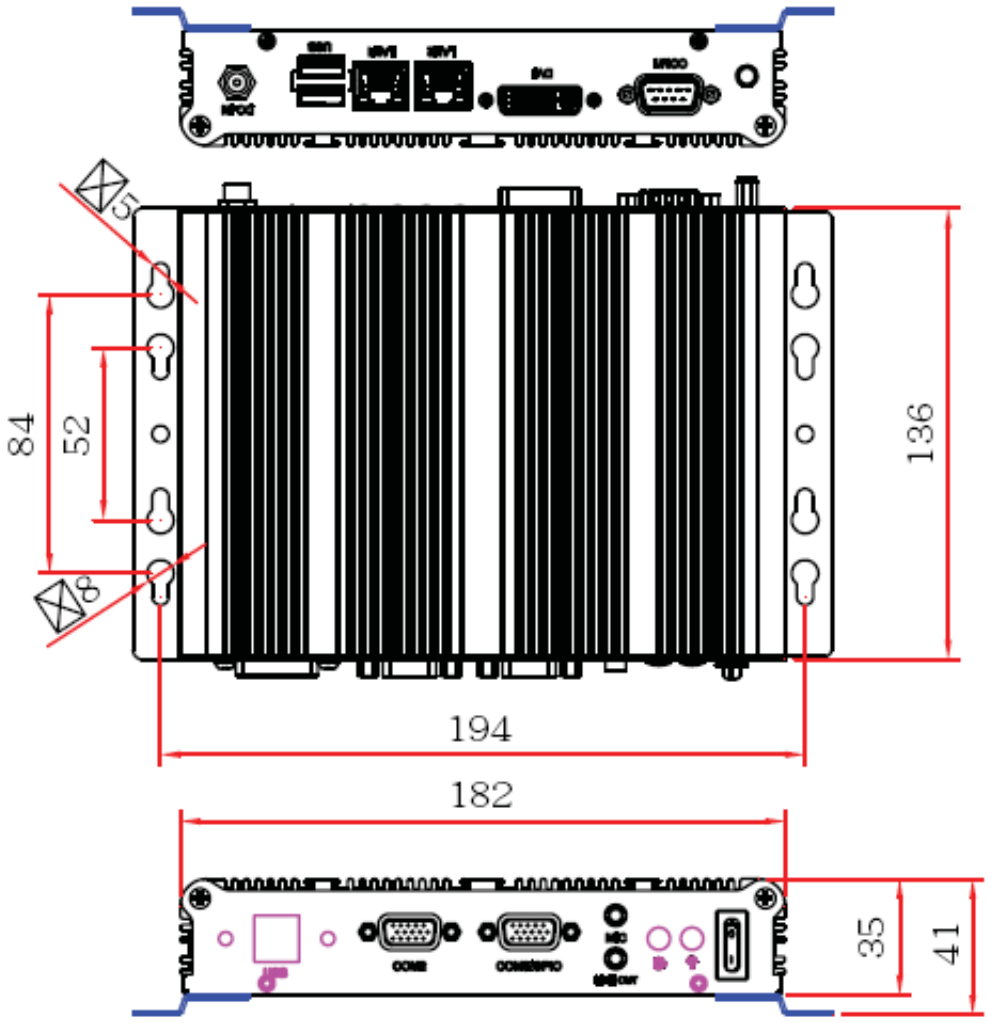
Operating Temp.	• -20 ~ -60°C, ambient w/ air
Storage Temp.	• -40 ~ 85°C
Relative Humidity	• 10 ~ 95% @ 40°C (non-condensing)
Vibration	• MIL-STD-810F, Method 514.5, Procedure 1, Category 4
Shock & Crash	• Operating 20G (11ms), Non-Operating 60G with HDD • Operating 40G (11ms), Non-Operating 80G with SSD • Crash 100G (11ms)
Power Input	• DC 12V Input
Construction	• Aluminum alloy
Mounting	• Supports both of wall-mount/VESA-mount
Weight	• 810g (barebone)
Dimensions	• 182 x 136 x 35mm

■ 1.2 SBOX-2000 Illustration

☞ Mainboard



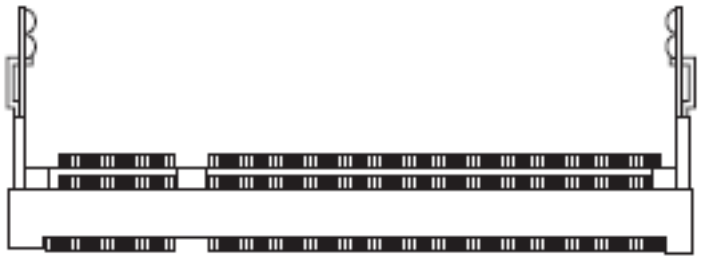
☞ System



■ 1.3 Memory Module Installation

The SBOX-2000 provide one 200pins SODIMM slot for DDR2 533MHz SDRAM memory modules and supports memory sizes up to 2GB.

These DIMM slots are inteded for memory modules.



DDR2 SO-DIMM Slot
200-pin, 1.8V

Installing Memory Module

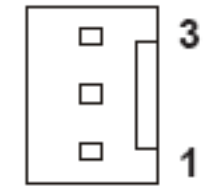
1. Locate the DIMM1 SO-DIMM slot. Align the notch on the DIMM with the key on the slot and insert the DIMM into the slot at 45-degree angle.
2. Push the DIMM gently forwards until the slot levers click and lock the DIMM in place. Follow the same procedures to install the second DIMM if necessary.
3. To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly.

Important

You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.

■ 1.4 Power Supply

5V/12V HDD Power Connector : JPWR1
This connector provides power to the hard disk drives.



JPWR1

PIN	SIGNAL
1	GND
2	VCC5
3	+12V

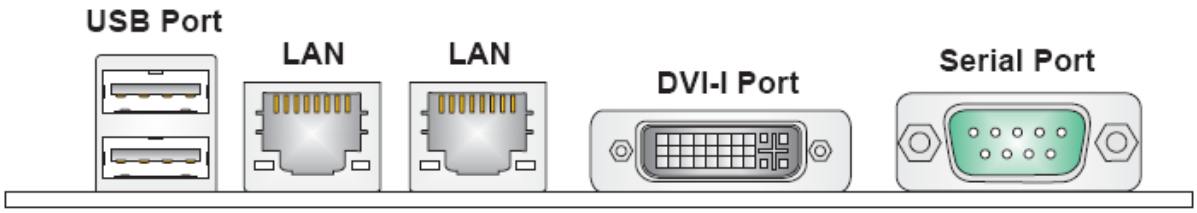
12V System Power Connector : PWR1
This connector provides power to the hard disk drives.

PWR1

PIN	SIGNAL
1	+12V
2	+12V
3	GND
4	GND

Important
Power supply of 200watts (and above) is highly recommended for system stability.

■ 1.5 RJ-45 LAN Connector LEDs

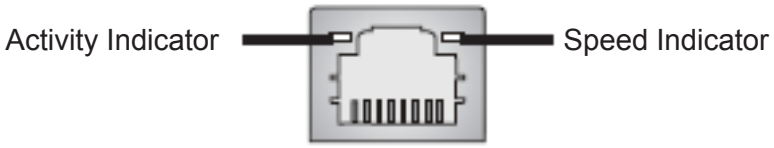


☞ USB Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

☞ LAN

The standard RJ-45 LAN jack is for connection to the local Area Network (LAN). You can connect a network cable to it.



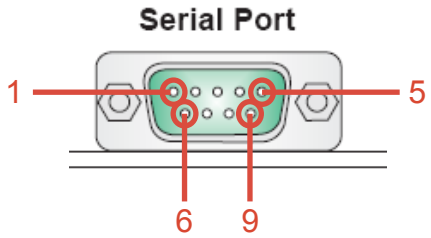
		Left LED	Right LED
		Active LED	**100M/1000 Speed LED**
LED Color		Yellow	Green/Orange
10M Cable Plug-in	**No Transmission**	OFF	OFF
	Transition	Yellow (Blinking)	OFF
100M Cable Plug-in	**No Transmission**	OFF	Green (Lighting)
	Transition	Yellow (Blinking)	Green (Lighting)
1000M Cable Plug-in	**No Transmission**	OFF	Orange (Lighting)
	Transition	Yellow (Blinking)	Orange (Lighting)
In S3/S4/S5 standby State		Green (Lighting)	OFF

☞ DVI-I Port

The DVI-I (Digital Visual Interface-Integrated) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computerand its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)

☞ Serial Port

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.



RS232 Function

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage output, voltage select setting by J1

RS485 Function

PIN	DESCRIPTION
1	485-, RS-485 transmission line, negative
3	485+, RS-485 transmission line, positive

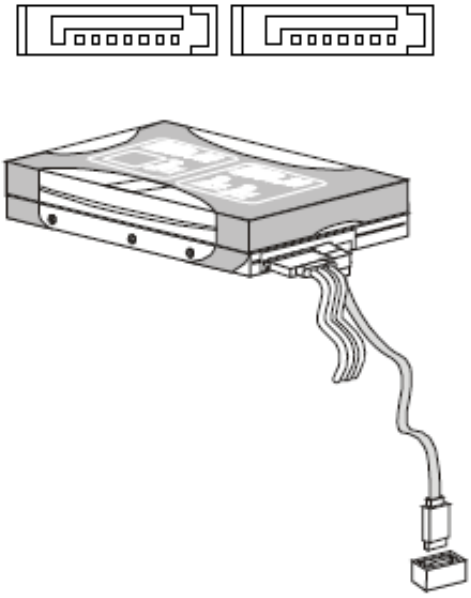
RS422 Function

PIN	DESCRIPTION
1	422TXD-, RS-422 transmission line, negative
2	422RXD+, RS-422 receiving line line, positive
3	422TXD+, RS-422 transmission line, positive
4	422RXD-, RS-422 receiving line, negative

■ 1.6 Connectors

Serial ATA II Connector : SATA1, SATA2

This connector is a high-speed Serial ATA II interface port. Each connector can connect to one Serial ATA II device.



Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

SPI Flash ROM Connector : JSP1
This connector is used to flash SPI flash ROM.

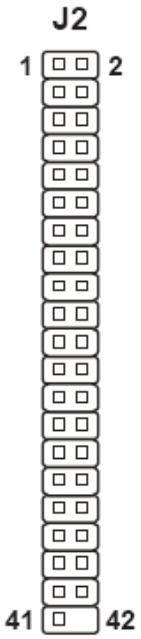
PIN	SIGNAL	PIN	SINNAL
1	VCC3_SB	2	VCC3_SB
3	SPI_MISO_F	4	SPI_MOSI_F
5	SPI_CS0_F#	6	SPI_CLK_F
7	GND	8	GND
9	SPI_HOLD#	10	NC

Keyboard/Mouse Connector : JKBMS1
This connector is used to connector PS/2 keyboard & mouse.

PIN	SIGNAL	PIN	SINNAL
1	VCC5	2	VCC5
3	NC	4	NC
5	GND	6	GND
7	MSCLK_PH#	8	KBCLK_PH#
9	MSDAT_PH#	10	KBDAT_PH#

Serial Port Connector :J2

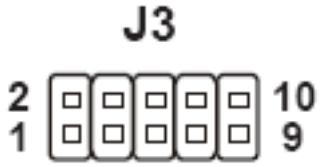
This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach serial devices to it through the optional serial port bracket.



PIN	SIGNAL	PIN	SINNAL
1	COM_NDCD2	21	COM_NDCD4
2	COM_NRD2	22	COM_NRD4
3	COM_NTD2	23	COM_NTD4
4	COM_NDTR2	24	COM_NDTR4
5	GND	25	GND
6	COM_NDSR2	26	COM_NDSR4
7	COM_NRTS2	27	COM_NRTS4
8	COM_NCTS2	28	COM_NCTS4
9	VCC_COM2	29	VCC_COM4
10	No Connection	30	No Connection
11	COM_NDCD3	31	COM_NDCD5
12	COM_NRD3	32	COM_NRD5
13	COM_NTD3	33	COM_NTD5
14	COM_NDTR3	34	COM_NDTR5
15	GND	35	GND
16	COM_NDSR3	36	COM_NDSR5
17	COM_NRTS3	37	COM_NRTS5
18	COM_NCTS3	38	COM_NCTS5
19	VCC_COM3	39	COM_NRI5
20	No Connection	40	No Connection

Digital IO Connector : J3

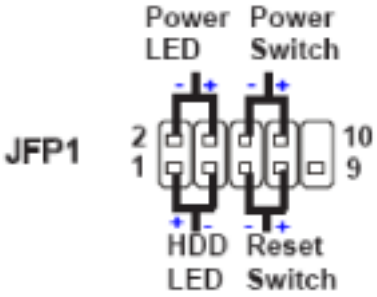
This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.



PIN	SIGNAL	PIN	SINNAL
1	GND	2	VCC5
3	N_GPO 3	4	N_GPO1
5	N_GPO 2	6	N_GPO 0
7	N_GPI 3	8	N_GPI 1
9	N_GPI 2	10	N_GPI 0

Front Panel Connector : JFP1

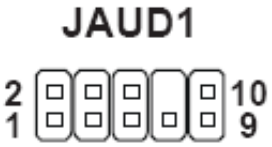
This front panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.



PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	PWR/SLP GND	MSG LED pull-down to GND
3	HD_LED -	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW -	Power Switch low reference pull-down to GND
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW +	Power Switch high reference pull-up
9	RSVD_DNU	Reserved. Do not use.
10	KEY	Key

Front Panel Audio Connector : JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel Front Panel I/O Connectivity Design Guide.



PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	PRESENCE#	Active low signal-signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected
5	LINE out_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No connection
9	LINE out_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

LVDS Flat Panel Connector : JLVDS1

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interfaced flat panel to the JLVDS1, be sure to check the panel datasheet and set the JVDD1 jumper (p.18) to proper power voltage..

Display Matrix

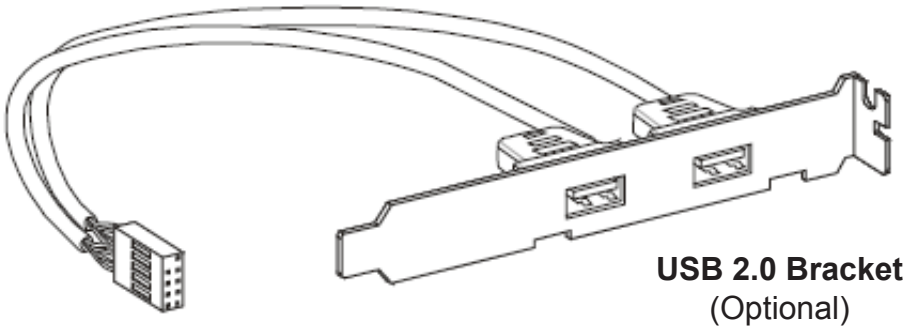
	CRT	LVDS	DVI	HDMI
CRT		V	V	V
LVDS	V		V	V
DVI	V	V		V
HDMI	V	V	V	

SIGNAL	PIN		SIGNAL
+12V	2	1	+12V
+12V	4	3	+12V
GND	6	5	+12V
GND	8	7	VCC3/VCC5
LCD_VDD	10	9	LCD_VDD
LDDC_DATA	12	11	LDDC_CLK
LVDS_VDDEM	14	13	L_BKLTCTL
GND	16	15	L_BKLTEM
LA_DATA0	18	17	LA_DATA0#
LA_DATA1	20	19	LA_DATA1#
LA_DATA2	22	21	LA_DATA2#
LA_CLK	24	23	LA_CLK#
LA_DATA3	26	25	LA_DATA3#
GND	28	27	GND
LB_DATA0	30	29	LB_DATA0#
LB_DATA1	32	31	LB_DATA1#
LB_DATA2	34	33	LB_DATA2#
LB_CLK	36	35	LB_CLK#
LB_DATA3	38	37	LB_DATA3#
GND	40	39	GND

Front USB Connector : JUSB1

This connector, compliant with Intel I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, modems and the like.

PIN	SIGNAL	PIN	SINNAL
1	USB_RSTR	2	GND
3	SBD1+	4	SBD0-
5	SBD1-	6	SBD0+
7	GND	8	USB_RSTR



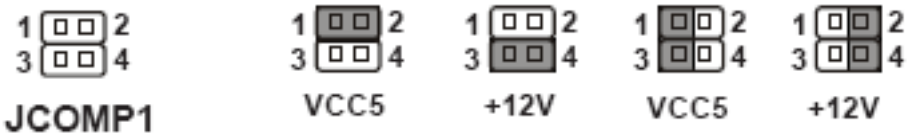
USB 2.0 Bracket
(Optional)

Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

■ 1.7 Jumpers

COM Port Power Jumper : JCOMP1
These jumpers specify the operation voltage of the onboard serial ports.



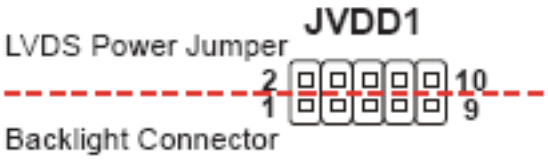
Clear CMOS Jumper : JBAT1
There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data..

Important

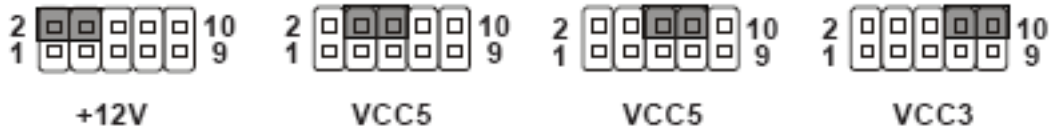
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Backlight Connector & LVDS Power Jumper : JVDD1

The backlight connector is provided for LCD backlight options while the LVDS power jumper allows users to select the operation voltage of the LVDS interfaced flat panel..



PIN	SIGNAL
1	VCC5
3	L_BKLTCTL
5	INV_ON
7	GND
9	+12V



PCI (Peripheral Component Interconnect) Express Slot

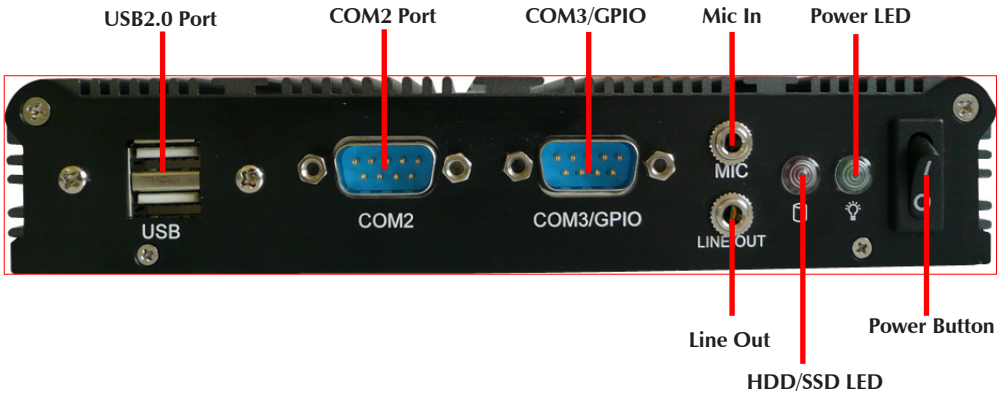
The PCI Express slot supports the PCI Express interface expansion card.
The CON1 is a Mini PCI-E connector for wireless LAN, TV tuner, and Robson NAND Flash.

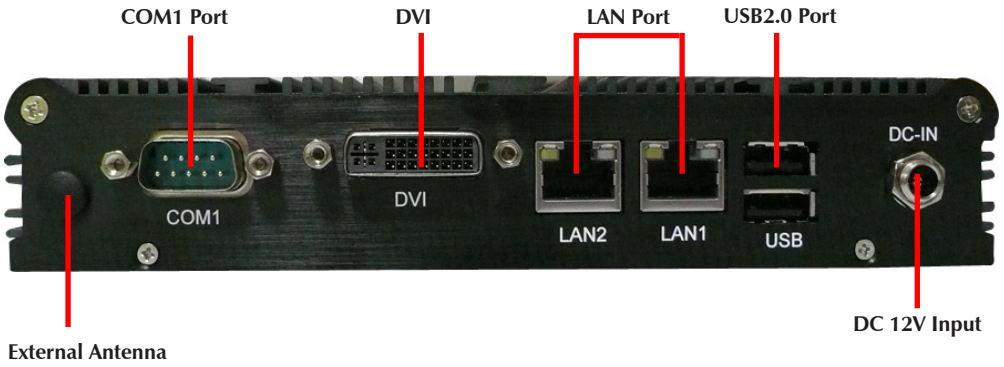
Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

2 System Installation

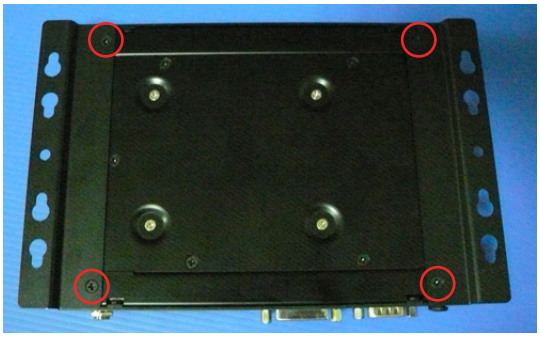
■ 2.1 System Introduction



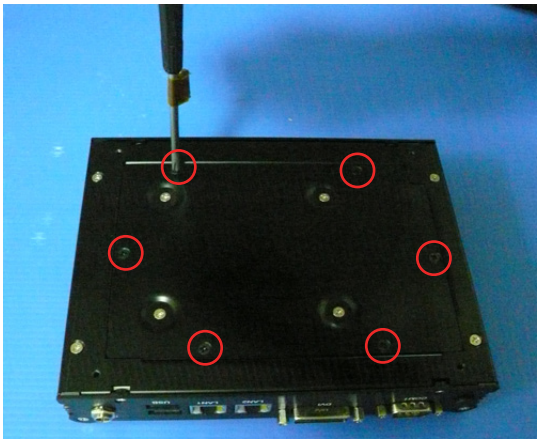


■ 2.2 Opening Chassis

Step 1. Unscrew the four screws of the Mounting Bracket as shown in the picture.



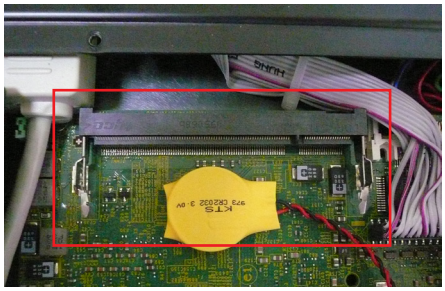
Step 2. Unscrew the six screws of the Back Cover as shown in the picture.



Step 3. Open the Back Cover as shown in the picture.

■ 2.3 Installing Memory

Step 1. Put Memory on this place as shown in the picture.



Step 2. Hold the Memory with its notch aligned with the Memory socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

Step 3. Fully insert the module into the socket until a “click” is heard as shown in the picture.

Step 4. Press down on the Memory so that the tabs of the socket lock on both sides of the module as shown in the picture.

■ 2.4 Installing HDD / SSD

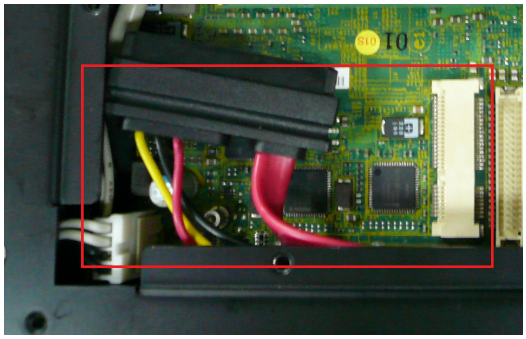
Step 1. Put the HDD on the Back Cover as shown in the picture.

Step 2. Turn over the Back Cover and screw the four screws of the Back Cover as shown in the picture.

Step 3. Connect the HDD power cable and SATA cable to HDD as shown in the picture.

■ 2.5 Installing MINI PCI Express Expansion Card (WiFi Module)

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.

Step 3. Screw one screw to the holder as shown in the picture.

Step 4. Done as shown in the picture.

3 BIOS

■ 3.1 Entering The BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

SBOX-2000 Mainboard V1.0 073109 where :

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS was released.

073109 refers to the date this BIOS was released.

Control Keys

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F9>	Load Optimized Defaults
<F8>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

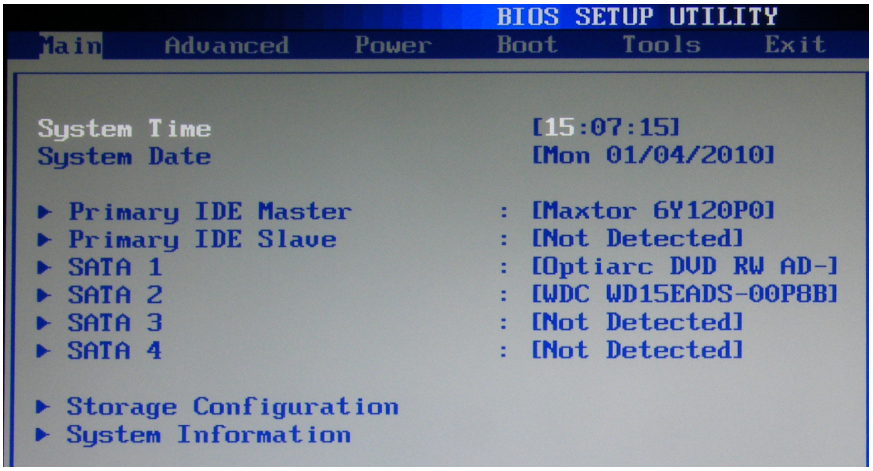
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu
The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu
If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

■ 3.2 Main


BIOS SETUP UTILITY
Main Advanced Power Boot Tools Exit
System Time [15:07:15]
System Date [Mon 01/04/2010]
▶ Primary IDE Master : [Maxtor 6Y120P0]
▶ Primary IDE Slave : [Not Detected]
▶ SATA 1 : [Optiarc DVD RW AD-]
▶ SATA 2 : [WDC WD15EADS-00P8B]
▶ SATA 3 : [Not Detected]
▶ SATA 4 : [Not Detected]
▶ Storage Configuration
▶ System Information

System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

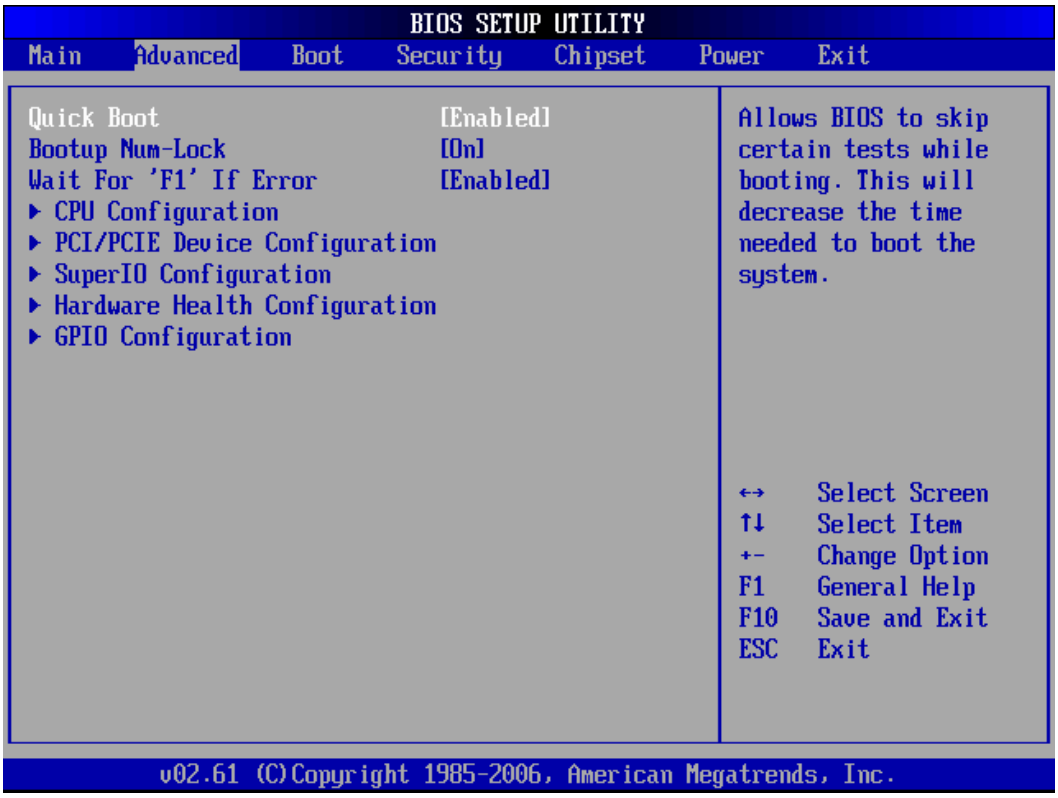
System Date

This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

Primary IDE Master/Slave, SATA 1/2

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.
[Block (Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block.
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller

■ 3.3 Advanced


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
Quick Boot [Enabled]
Bootup Num-Lock [On]
Wait For 'F1' If Error [Enabled]
▸ CPU Configuration
▸ PCI/PCIE Device Configuration
▸ SuperIO Configuration
▸ Hardware Health Configuration
▸ GPIO Configuration
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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☞ CPU Configuration

» Max CPUID Value Limit

The Max CPUID Value Limit BIOS feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

» Execute Disable Bit Capability

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

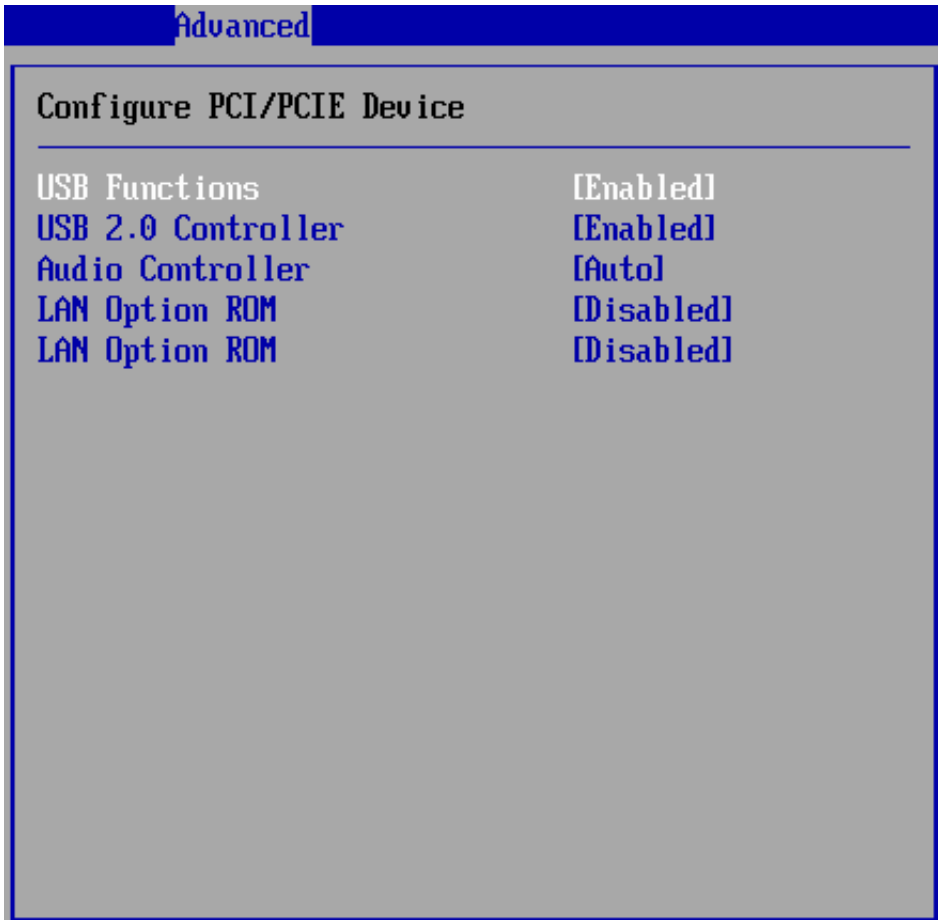
» Hyper Threading Technology

The processor uses Hyper Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.

» Intel(R) SpeedStep(tm) Tech

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production..

☞ PCI/ PCIE Device Configuration



» **USB Functions**

This setting specifies the operation mode of the onboard USB controller.

» **USB 2.0 Controller**

This setting enables/disables the onboard USB controller.

» **Audio Controller**

This setting enables / disable the onboard USB controller.

» **LAN Option ROM**

The items enable or disable the initiation of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process.

☞ Super IO Configuration

Advanced
Configure Ite8783 Super IO Chipset
Serial Port1 Address [3F8]
Serial Port1 Mode [RS232]
Serial Port2 Address [Disabled]
Serial Port3 Address [3E8]
Serial Port3 IRQ [11]
Serial Port3 Mode [Normal]
Serial Port4 Address [2E8]
Serial Port4 IRQ [11]
Serial Port4 Mode [Normal]
Serial Port5 Address [2F0]
Serial Port5 IRQ [5]
Serial Port5 Mode [Normal]
Serial Port6 Address [Disabled]
Watch Dog [Enabled]
Watch Dog timer Mode [Enable for Min]
Watch Dog Timer [1]

» **Serial Port 1/2/3/4/5/6 Address, Serial Port 3/4/5 IRQ**

Select an address and a corresponding interrupt for the specified serial ports.

» **Serial Port 3/4/5 Mode**

These settings specify the operation mode of the specified serial prots.

» **Watch Dog**

You can enable the system watch-dog timer, a heardware timer that generates either an NMI or a reset when the software that it monitors does not respond as expected each time the watch Dog Timer action.

» **Watch Dog Timer Mode**

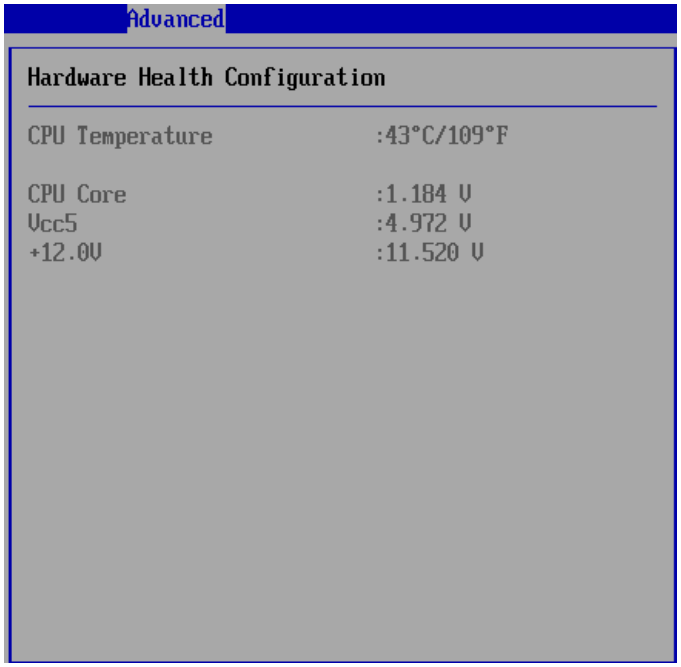
The setting specifies the Watch Dog Timer action.

» **Watch Dog Timer**

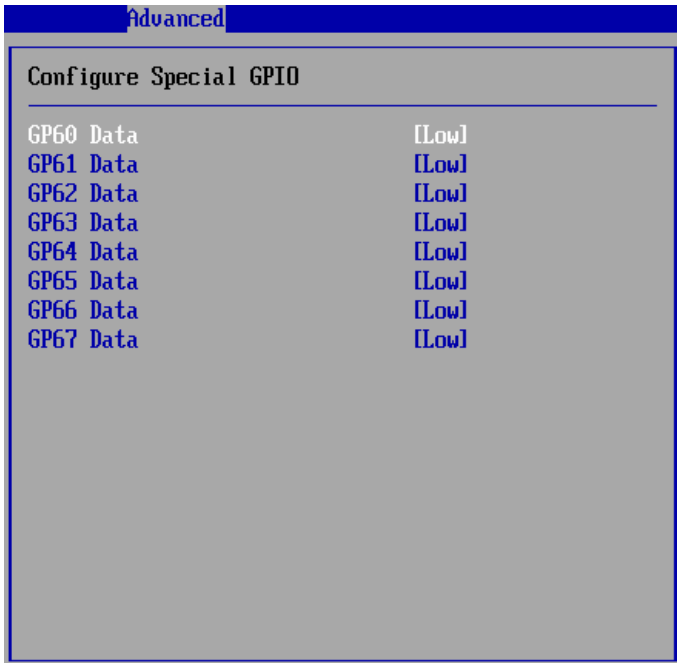
The setting specifies the Watch Dog Timer time out value.

☞ Hardware Health Configuration

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.



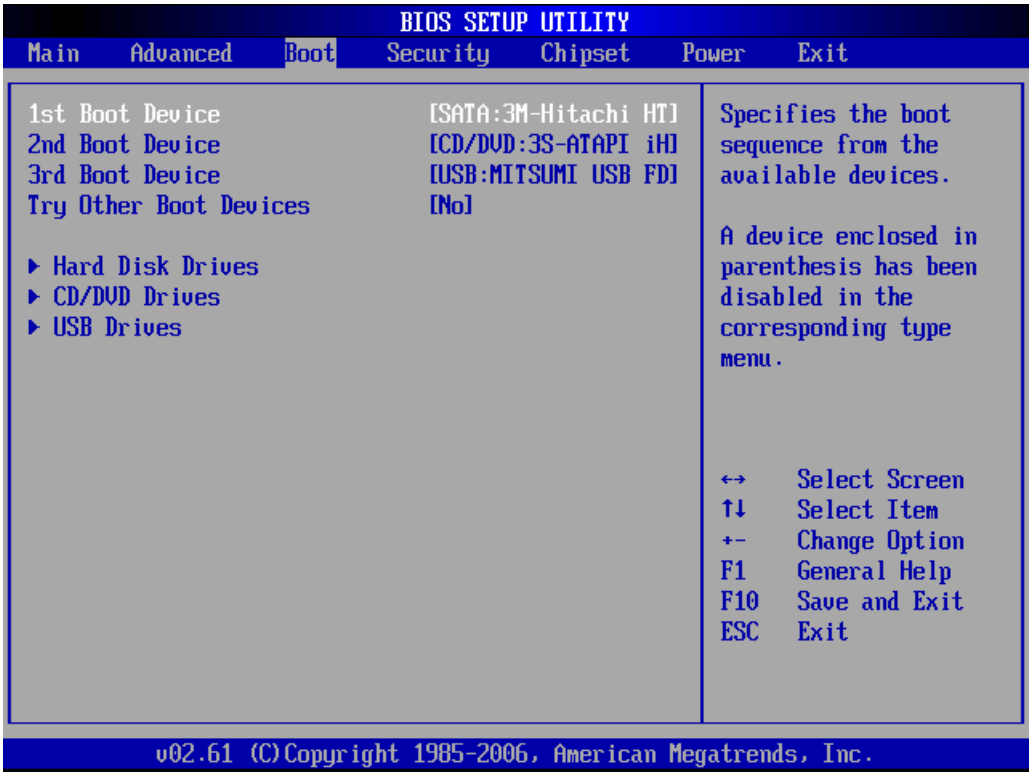
☞ GPIO Configuration



» **GP 60/ 61/ 62/ 63/ 64/ 65/ 66/ 67 Data**

These settings configure special GPIO data.

■ 3.4 Boot


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
1st Boot Device [SATA:3M-Hitachi HT]
2nd Boot Device [CD/DVD:3S-ATAPI iH]
3rd Boot Device [USB:MITSUMI USB FD]
Try Other Boot Devices [No]
▸ Hard Disk Drives
▸ CD/DVD Drives
▸ USB Drives
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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» **1st/2nd/3rd Boot Device**

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

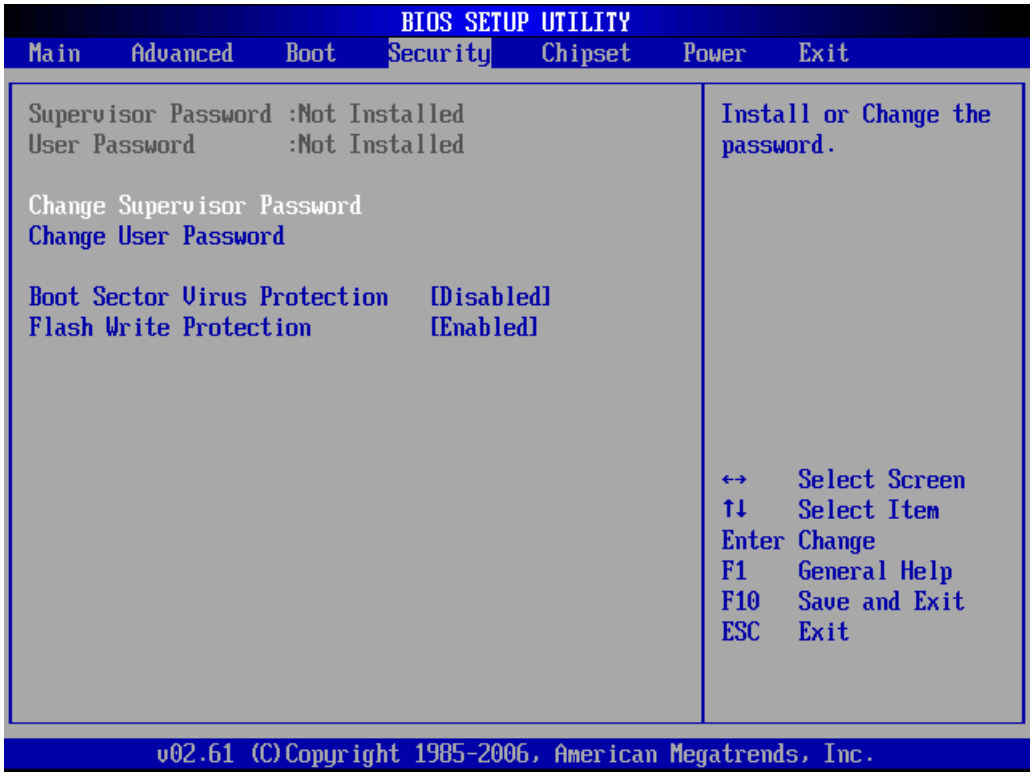
» **Try Other Boot Devices**

Setting the option to [Enabled] allows the system to try to boot from other device if the system fail to boot from the 1st/2nd/3rd boot device.

» **Hard Disk Drives, CD/DVD Drives, USB Drives**

These settings allow you to set the boot sequence of the specified devices.

■ 3.5 Security



» **Supervisor Password / Change Supervisor Password**

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

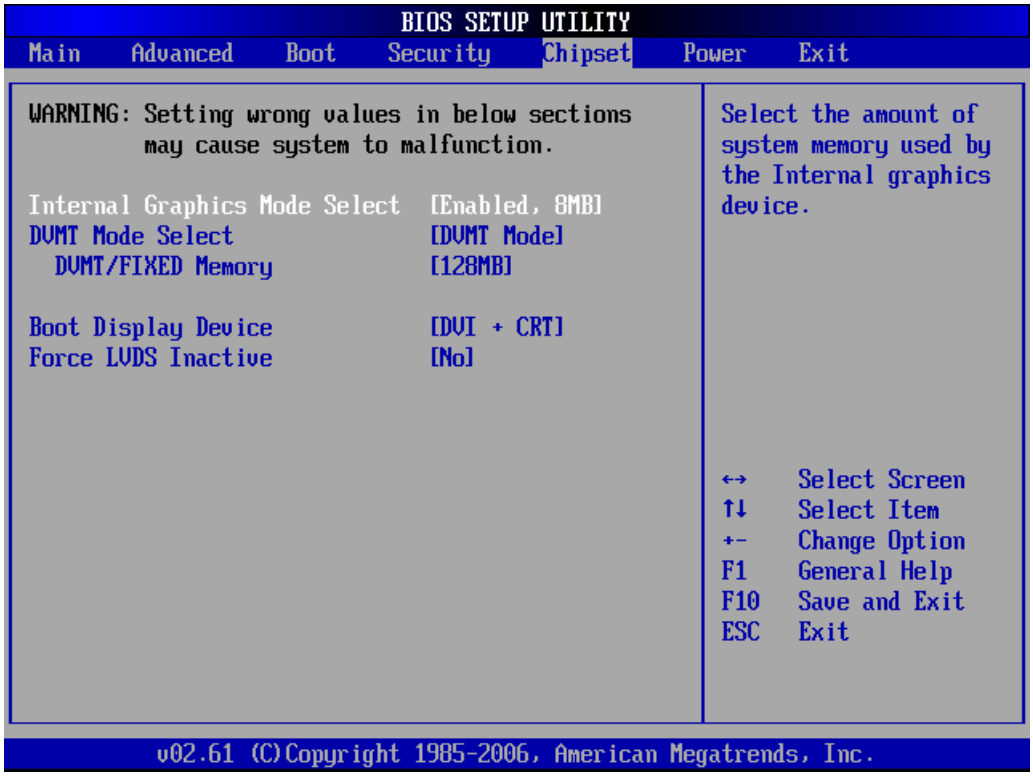
» **User Password / Change User Password**

User Password controls access to the system at boot. These settings allow you to set or change the user password.

» **Boot Sector Virus Protection**

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

■ 3.6 Chipset


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
WARNING: Setting wrong values in below sections may cause system to malfunction.
Internal Graphics Mode Select [Enabled, 8MB]
DVMT Mode Select [DVMT Mode]
DVMT/FIXED Memory [128MB]
Boot Display Device [DVI + CRT]
Force LVDS Inactive [No]
Select the amount of system memory used by the Internal graphics device.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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» Internal Graphics Mode Select

The field specifies the size of system memory allocated for video memory.

» DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

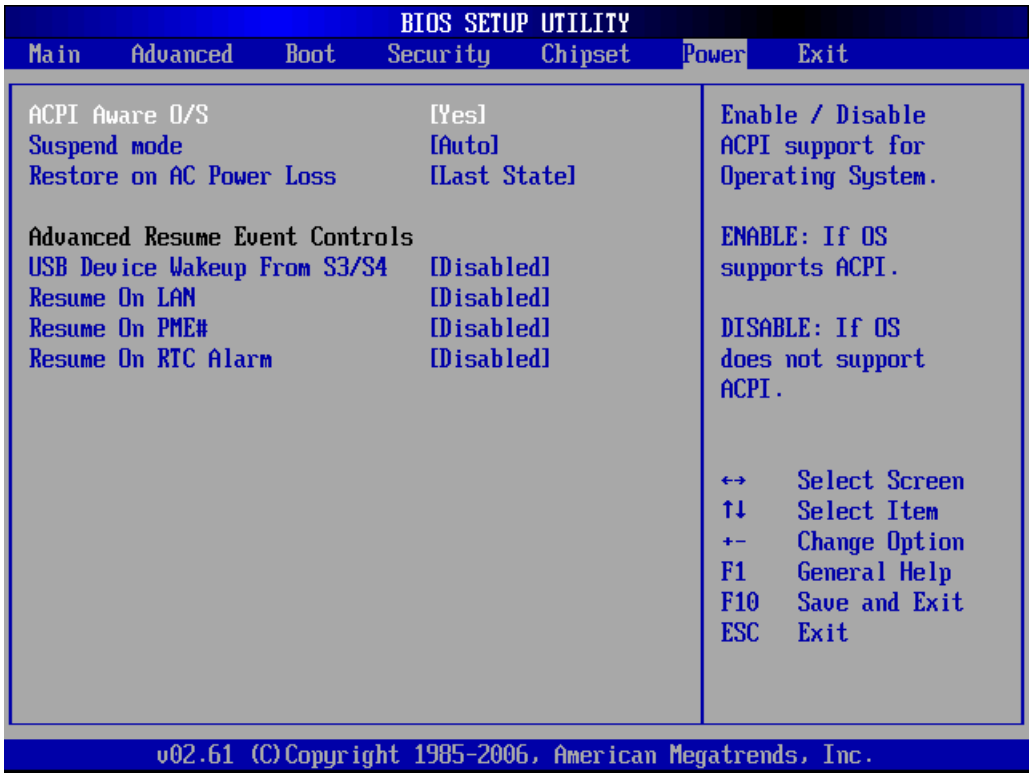
» Boot Display Device

Use the field to select the type of device you want to use as the display(s) of the system.

» Force LVDS Inactive

This setting determines whether to force the LVDS inactive or not.

■ 3.7 Power


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
ACPI Aware O/S [Yes]
Suspend mode [Auto]
Restore on AC Power Loss [Last State]
Advanced Resume Event Controls
USB Device Wakeup From S3/S4 [Disabled]
Resume On LAN [Disabled]
Resume On PME# [Disabled]
Resume On RTC Alarm [Disabled]
Enable / Disable ACPI support for Operating System.
ENABLE: If OS supports ACPI.
DISABLE: If OS does not support ACPI.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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» ACPI Aware O/S

This setting enables/disables ACPI (Advanced Configuration and Power Interface) support for Operating System. Set to [No] if your OS doesn't support ACPI and set to [Yes] if ACPI is supported.

» Suspend Mode

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

» Restore on AC Power Loss

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the computer in the power off state.
[Power On]	Leaves the computer in the power on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occured.

» **USB Device Wakeup From S3/S4**

This setting allows the activity of the USB device to wake up the system from the S3/S4 sleep state.

» **Resume On LAN**

This field specifies whether the system will be awadened from power saving modes when activity or input signal of onboard LAN is detected..

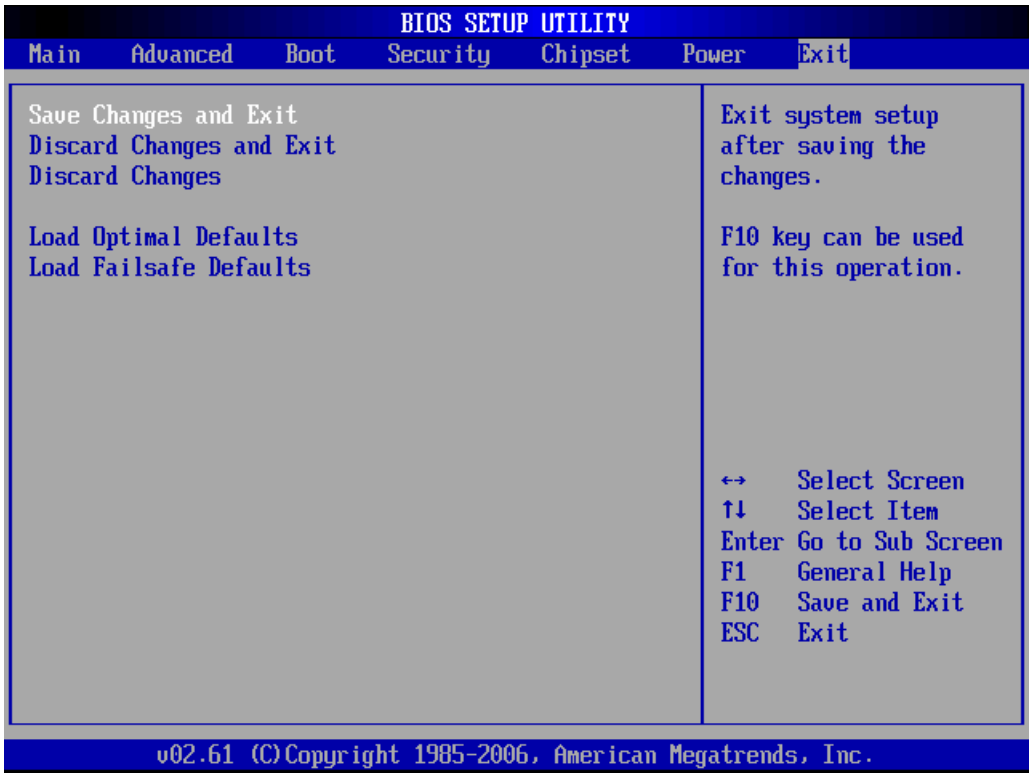
» **Resume On PME#**

When setting to [Enabled], the feature allows your system to be awakended from the power saving modes through any event on PME (Power management Event):

» **Resume On RTC Alarm**

When [Enable], you can set the date and time at which the RTC (Real-Time Clock) alarm awakens the system from suspend mode.

■ 3.8 Exit


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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» **Save Changes and Exit**

Save changes to CMOS and exit the Setup Utility.

» **Discard Changes and EXit**

Abandon all changes and exit the Setup Utility.

» **Discard Changes**

Abandon all changes and continue with the Setup Utility.

» **Load Optimal Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

» **Load Failsafe Defaults**

Use this menu to load the default values set by the BIOS vendor for stable system performance.

4 System Resources

■ 4.1 Watch Dog Timer Setting

```
Software code
SIO_IDX equ 2Eh
SIO_DTA equ 2Fh
Timer equ 10; reset after 10 seconds
```

```
1. Enter configuration mode
    mov    dx,SIO_IDX
    mov    al,87h
    out    dx,al
    mov    al,01h
    out    dx,al
    mov    al,55h
    out    dx,al
    out    dx,al
```

```
2. Set to LDN 07
    mov    dx,SIO_IDX
    mov    al,07h
    out    dx,al
    mov    dx,SIO_DTA
    mov    al,07h
    out    dx,al
```

```
3. Set WatchDog Timer
    mov    dx,SIO_IDX
    mov    al,073h
    out    dx,al
    mov   dx,SIO_DTA
    mov   al,Timer
    out    dx,al
```

```
4. Exit configuration mode
    mov   dx,SIO_IDX
    mov   al,02h
    out    dx,al
    mov   dx,SIO_DTA
    out    dx,al
```

■ 4.2 AMI Post Code

» Bootblock Initialization Code Checkpoints

The Bootblock initialization code sets up the chipset, memory and other components before system memory is available. The following table describes the type of checkpoints that may occur during the bootblock initialization portion of the BIOS:

Checkpoint	Description
Before D1	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4GB limit and GA20 enabled. Verify the boot-block checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See Bootblock Recovery Code Checkpoints section of document for more information.
D7	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See POST Code Checkpoints section of document for more information.

» POST Code Checkpoins

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable “wCMOSFlags.”
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system.
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to “POSTINT1ChHandlerBlock.”
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.

Checkpoint	Description
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.

Checkpoint	Description
84	Log errors encountered during POST
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

■ 4.3 Resource List

» ICH7M GPIO

Pin	GPIO	Type	Multiplexed with	Power	Connect
AB18	GPIO0	I/O	BM_BUSY#	VCC3	PM_BMBUSY#
C8	GPIO1	I/O	REQ[5]#	VCC5	PREQ#5
G8	GPIO2	I/OD	PIRQE#	VCC5	VCC3
F7	GPIO3	I/OD	PIRQF#	VCC5	VCC3
F8	GPIO4	I/OD	PIRQG#	VCC5	VCC3
G7	GPIO5	I/OD	PIRQH#	VCC5	VCC3
AC21	GPIO6	I/O	Unmultiplexed	VCC3	ATADET0
AC18	GPIO7	I/O	Unmultiplexed	VCC3	SIO_OVT#
E21	GPIO8	I/O	Unmultiplexed	3VSB	PANEL+
E20	GPIO9	I/O	Unmultiplexed	3VSB	PANEL-
A20	GPIO10	I/O	Unmultiplexed	3VSB	VOLUME+
B23	GPIO11	I/O	SMBALERT#	3VSB	SMBALERT#
F19	GPIO12	I/O	Unmultiplexed	3VSB	SPI_HOLD_GPO#
E19	GPIO13	I/O	Unmultiplexed	3VSB	SIO_PME#
R4	GPIO14	I/O	Unmultiplexed	3VSB	VOLUME
E22	GPIO15	I/O	Unmultiplexed	3VSB	3VSB
AC22	GPIO16	I/O	DPRSLPVR	VCC3	DPRSLPVR
D8	GPIO17	I/O	GNT5#	VCC3	PGNT#5
AC20	GPIO18	I/O	STPPCI#	VCC3	PM_STPPCI#
AH18	GPIO19	I/O	SATA1GP	VCC3	SATA1GP
AF21	GPIO20	I/O	STPCPU#	VCC3	PM_STPCPU#
AF19	GPIO21	I/O	SATA0GP	VCC3	SATA0GP
A13	GPIO22	I/O	REQ4#	VCC3	PREQ#4
AA51	GPIO23	I/O	LDRQ1#	VCC3	LPC_DRQ#1
B3	GPIO24	I/O	Unmultiplexed	3VSB	BIOS_WP#
D20	GPIO25	I/O	Unmultiplexed	3VSB	WLAN_PWRON
A21	GPIO26	I/O	Unmultiplexed	3VSB	NC
B12	GPIO27	I/O	Unmultiplexed	3VSB	NC
E23	GPIO28	I/O	Unmultiplexed	3VSB	NC
C3	GPIO29	I/O	OC5#	3VSB	3VSB

Pin	GPIO	Type	Multiplexed with	Power	Connect
A2	GPIO30	I/O	OC6#	3VSB	3VSB
B3	GPIO31	I/O	OC7#	3VSB	3VSB
AG18	GPIO32	I/O	CLKRUN#	VCC3	CLKRUN#
AC19	GPIO33	I/O	AZ_DOCK_EN#	VCC3	PRES2
U2	GPIO34	I/O	AZ_DOCK_RST#	VCC3	PRES3
AD21	GPIO35	I/O	SATACLKREQ#	VCC3	PRES1
AH19	GPIO36	I/O	SATA2GP	VCC3	SATA2GP
AE19	GPIO37	I/O	SATA3GP	VCC3	SATA3GP
AD20	GPIO38	I/O	Unmultiplexed	VCC3	NC
AE20	GPIO39	I/O	Unmultiplexed	VCC3	NC
A14	GPIO48	I/O	GNT4#	VCC3	PGNT#4
AG24	GPIO49	I/O	CPUPERGD	VTT	CPU_PWRGD

■ 5.1 Packing List

1. SBOX-2000 System

2. Power adapter

3.Mounting bracket

4. 1 GB DDRII SO-DIMM Memory (Optional)

5. 2 GB DDRII SO-DIMM Memory (Optional)

6. 2.5" 160GB Hard Disk Drive (Optional)

7. 802.11 b/g/n WiFi Kit (Optional)

8. 8GB MLC Type SSD (Optional)

9. 16GB MLC Type SSD (Optional)

10. 8GB SLC Type SSD (Optional)

11. 16GB SLC Type SSD (Optional)

12. VESA Mounting Kit (Optional)